

REMARKS

Claims 9-28 are pending in the present application. Claims 1-8 have been canceled without disclaimer or prejudice.

Applicant respectfully requests reconsideration of the application in view of the remarks appearing below.

Claim Objections

The Examiner has objected to claims 25-27 because the preambles of these dependent claims refer to "the method" instead of "the system". Applicants have made the requested changes to claims 25-27 and respectfully request that the Examiner withdraw such claim objections.

The Examiner has also objected to claims 10-15, 17-22 and 24-28 because the preambles of these dependent claims begin with "A" instead of "The". Applicants are not aware of any requirement in 35 U.S.C. § 112 or elsewhere that compels use of the term "The" instead of the term "A" in the preamble of a dependent claim. In order not to inadvertently limit the separate patentability of each of the dependent claims as a result of using the article "The", Applicants hereby respectfully traverse the objection made by the Examiner and request that the Examiner withdraw these claim objections.

Rejection Under 35 U.S.C. § 112

The Examiner has rejected claims 15 and 21 under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. The Examiner asserts that claims 15 and 21 contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to make and/or use the invention. Specifically, the Examiner takes the position that the portions of claims 15 and 21 stating that "the step of disabling any of said at least three physical copies that are faulty" are not described in the specification.

Fig. 2 of the specification shows three physical copies (Copy A, Copy B and Copy C) and paragraph 20 of the specification provides that "when an error signal is asserted . . . the redundant copy that is failing . . . is taken offline." Based on these disclosures in the specification, the only difference between the relevant portions of claims 15 and 21 and the specification is insertion of the word "disabling" in place of "taken offline." As one skilled in the art would know, "taken offline" and "disable" are synonymous.

In view of the preceding comments, it is clear that claims 15 and 21 are described in the specification in such a way as to enable one skilled in the art to make and/or use the invention.

Rejection Under 35 U.S.C. § 102

The Examiner has rejected claims 9 through 28 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,883,809 to Sullivan et al. Applicants respectfully disagree.

Sullivan et al. disclose a method and apparatus for verification and testing of a digital electric circuit. Specifically, a stimulus is applied to a circuit using a software-based controller. The actual output of the circuit is then compared to an expected output using a behavioral language software comparator to determine whether the circuit is functioning correctly.

In contrast, Applicants' claimed invention is a hardware-implemented fault protection method and system used to design a circuit so that it is able to continue working properly in the presence of a hardware fault by using redundancy for select logic functions. Plainly stated, Applicants' claimed invention allows an integrated circuit designer to designate, during the design phase, particular logic functions to be fault tolerant. Those designated logic functions are then redundantly built on the integrated circuit. A voter is also built on the circuit to ensure that the outputs of all redundant logic functions are the same. If one of the logic functions fails (i.e. produces a different output than the others), that particular logic function is disabled, thereby allowing the integrated circuit to continue to operate properly.

In other words, the invention disclosed by Sullivan et al. identifies output errors by using a behavioral language-based methodology to test digital circuit designs. Applicants' invention, on the other hand, is used to actually design the circuits themselves to be fault tolerant with respect to specific logic functions. Nothing in Sullivan et al. teaches or suggests this approach. In fact, the only similarity between Applicants' claimed invention and the method and apparatus claimed by Sullivan et al. is that they both relate to integrated circuits.

With respect to independent claims 9, 16 and 23, the Examiner asserts that Sullivan et al. disclose a method and system of inserting a testing point within an integrated circuit, comprising the steps of (a) creating an integrated circuit design description using a hardware design language at the register-transfer level, (b) adding a fault tolerant operator to the particular logic functions in said integrated circuit design description; and (c) building redundant copies for the particular logic functions having a fault tolerant operator.

Using hardware design languages (HDLs) to design integrated circuits at the register-transfer level (RTL) or at the behavioral level is commonly known and practiced in the field of integrated circuit design and is discussed both by Applicants and by Sullivan et al. in U.S. Patent No. 5,883,809. However, absolutely nowhere in U.S. Patent No. 5,883,809 do Sullivan et al. disclose, teach, suggest or even hint at adding a fault tolerant operator to particular logic function or building redundant copies for the particular logic function having a fault tolerant operator. In fact, the citations made by the Examiner to specific portions of U.S. Patent No. 5,883,809 do not in any way support the assertions made by the Examiner. For example, Fig. 4 in U.S. Patent No. 5,883,809 cited against Applicants is a segment of VHDL source code for the behavior language comparator and does not even remotely disclose "adding a fault tolerant operator to particular logic function".

The differences between the independent claims 9, 16 and 23 and the subject matter of the Sullivan et al. patent also apply to the dependent claims 10-15, 17-22 and 24-28. As such, all claims in the present application are believed to be novel over Sullivan et al.

In view of the preceding comments, it is clear that Applicants' claimed invention is novel over the Sullivan et al. patent. Further, there is not even the slightest suggestion in the Sullivan et al. patent or elsewhere that the invention described therein could be expanded to cover Applicants' claimed invention.

For at least the foregoing reasons, Applicants respectfully request that the Examiner withdraw the present anticipation rejection.

CONCLUSION

In view of the foregoing, Applicants submit that claims 9-28 are in condition for allowance. Therefore, prompt issuance of a Notice of Allowance is respectfully solicited. If any issues remain or if the Examiner continues to believe that the Applicants' invention is anticipated by Sullivan et al., Applicants respectfully request that the Examiner contact the undersigned attorney at the number listed below to conduct an interview with respect to the outstanding issues.

Respectfully submitted,

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BTV.465737.3